American Burn Association
Occupational Therapy
and Physical Therapy
Special Interest Group

Rehabilitation of the Burned Hand

43rd Annual Meeting
Chicago, IL
Tuesday, March 29, 2011
MEETING AGENDA

American Burn Association
PT/OT Special Interest Group
Tuesday, March 29, 2011
Northwest Hall 5

8:00 Welcome Lisa Forbes, MSc, OT Reg(MB)
8:05 – 8:25 Business Meeting
   MAC Update Michael A. Serghiou, OTR
   Announcements
   Abstract & Manuscript submission update Reg Richard, MS, PT
   Survey List Jonathan Niszczak, MS, OTR/L
8:25 – 8:45 Barbara Knothe Burn Therapist Achievement Award
   Burntherapist.com update Jonathan Niszczak, MS, OTR/L
8:45 Introduction of topics and speakers Lisa Forbes, MSc, OT Reg(MB)

LECTURES

8:45 – 9:00 Complex Splinting and Complex Splinting Case Reviews Nora Barrett, MS, OTR/L, CHT
9:00 – 9:15 Rehabilitation of the Burned Hand – Exercises Doug Baron, BSc, PT
9:15 – 9:30 Pediatric Hand Burns – Optimizing Outcomes Trudy Boulter, OTR, CHT
9:50 – 10:10 Break & Refreshments Refreshments provided by Bio-Concepts, Inc.

BREAKOUTS
Attendees choose 2 breakouts – attend one during “Breakout 1” and attend the second one during “Breakout 2”

10:10 – 10:40 Breakout 1
10:40 – 11:10 Breakout 2
11:10 – 11:50 Summaries of Breakouts and Q&A
   (5 minute summaries and 5 minutes for Q&A)

11:50 – 12:00 Final Wrap Up and Closure for 2011 Meeting Evaluations

* Bound Handout sponsored by Bio Med Sciences, Inc.
MEMBERSHIP ADVISORY COMMITTEE

The Membership Advisory Committee (MAC) committee is comprised of dedicated non-physician burn care professionals who serve the ABA in a variety of ways. It is the responsibility of all MAC members to facilitate the appropriate expression of concerns, questions, issues, needs and recommendations that the At-Large Members wish to bring before the Board of Trustees. Members of the MAC Committee attend each of the SIG meetings at the annual meeting in order to disseminate information regarding the ABA activities and general ABA information and opportunities.

Therapist Membership Advisory Committee Members:
Mary Jo Baryza PT, PCS
Ingrid Parry, MS, PT
Michael A. Serghiou OT, MBA

SPECIAL INTEREST GROUPS

Background

Special Interest Groups (SIGs) originated out of the expressed need of the ABA membership to have small, informal groups in which to link with others with similar interests in an effort to exchange ideas, network with colleagues, share information and problem-solve. As the ABA grew, so did the number of SIGs. By 2003, there were 18 SIGs ranging in size from 10 to over 300 individuals attending various SIG meetings in conjunction with the ABA Annual Meeting.

The Special Interest Groups (SIG) hold meetings in conjunction with the Annual Meeting of the ABA. These meetings provide an opportunity for exchange of ideas, networking with colleagues, and information sharing. All ABA meeting participants are encouraged to attend these meetings, which are scheduled at times that do not conflict with the general meeting. These meetings are open to both members and nonmembers of the ABA.

Physical Therapy / Occupational Therapy (PT/OT)
This SIG provides opportunities for professional exchange of ideas, with colleagues on new treatment methods, research activity and clinical problem solving. Another focus is to encourage burn therapist involvement in the ABA. We have recently instituted a three year plan with two Co-Chairs to ensure continuity and consistency.

2011 Chair: Lisa Forbes, MSc, OT Reg(MB)
2011 Co-Chair: Sam K. Yohannan MS, PT
2011 Co-Chair: Trudy Boulter, OTR, CHT
Kim Walker, OTR

Kim has been involved in the treatment and rehabilitation of adult and pediatric burn survivors for over 18 years as an occupational therapist. She has been an active member of the ABA for 16 of those years. Like Barb Knothe, she has been a ‘silent’ contributor to the burn rehabilitation community but that does not mean she has not contributed significantly especially locally to the patients she treats at Memorial Hermann Hospital in Houston Texas.

Her accomplishments include lead author of 8 ABA abstracts as well as co-authoring 13 other abstracts. Of particular note, is the wide variety of subject matter these abstract topics encompass which further demonstrates Kim’s ability to provide effective treatment interventions and rehabilitative strategies to her patients. She has moderated 3 Sunrise Symposia and has presented multiple times at the OT/PT Special Interest Group. Most recently in 2010 she was a co-author of the JBCR manuscript “Methods and Tools for the Measurement of Burn Scar Contractures.”

Kim has lectured extensively in the area of burn rehabilitation around the State of Texas to varying colleges and organizations including the Texas Occupational Therapy Association. She is a member of the Phoenix Society’s SOAR program and has assisted with a number of local burn camps in her area.

Kim has demonstrated exceptional performance, dedication, and service to burn care and rehabilitation by her many years of contributions to her patients and in support of the ABA. Moreover, it is Kim's passion and innovative thinking while treating and supporting burn survivors in every capacity that make her a model for outstanding contribution and excellence in the burn rehabilitation service.
The **BurnTherapist.com** web site – is the first site dedicated to the work and endeavors of Burn Occupational & Physical Therapists in an effort to develop outcome based research and clinical improvements for all burn survivors. We are committed to fostering collaborative networking relationships among burn therapists as well as developing clinical research, treatment innovations and improvement in service delivery and care at local, national and international levels.

We also highlight the achievements of Burn Occupational & Physical Therapists as part of the American Burn Association's Occupational & Physical Therapist Special Interest Group through the yearly Barbara Knothe Burn Therapist Achievement Award. We are a resource for therapist driven research and collaboration to provide the best treatment outcomes for the patients that we serve.

**Burn Clinical Pearls (formerly Splinting Quarterly)**

Each Quarter (January, April, July & October) we will highlight a splinting endeavor that has been created to work with a challenging surgical intervention or as a result of a unique patient need or request. New designs as well as modifications to an existing, established design are welcomed. Post-operative splints as well as adaptive device splints, casting and any other type of ADL modification gladly are welcome. We will also be archiving all of the submissions so that we can maintain a resource of burn splinting knowledge. Contribute to the accumulated knowledge and submit your splint design to today!

Go to the web site [www.burntherapist.com](http://www.burntherapist.com) and get involved!
• ***Lisa Forbes, MSc, OT Reg(MB) – Chair***  
  Clinical Specialist in Burn Care  
  Winnipeg Health Sciences Centre  
  Winnipeg, Manitoba  
  E-mail: lforbes-duchart@hsc.mb.ca

• ***Sam K. Yohannan, MS, PT – Co-Chair***  
  Senior Physical Therapy Specialist  
  Clinical Research Project Coordinator  
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• ***Trudy Boulter, OTR, CHT – Co-Chair***  
  Occupational Therapist  
  The Children's Hospital  
  Denver, Colorado  
  E-mail: boulter.trudy@tchden.org

• ***Nora Barrett, MS, OTR/L, CHT***  
  Occupational Therapist  
  Washington Hospital Center- Regional Burn Unit  
  Washington, DC  
  E-mail: Nora.Barrett@Medstar.net

• ***Doug Baron BSc PT (IIWCC)***  
  Burn Clinic Coordinator and Team Leader MSK Outpatient Physiotherapy  
  Alberta Children’s Hospital  
  Calgary, Alberta  
  E-mail: Doug.Baron@albertahealthservices.ca

• ***Sandy Fletchall OTR/L, CHT, MPA, FAOTA***  
  Clinical Director  
  Capabilities For Living, LLC  
  Memphis, TN
VISION FOR THE 2010 PT/OT SIG

This year, the PT/OT SIG will focus on rehabilitation of the burned hand. Certified hand therapists will provide lectures on topics such as complex splinting, exercises, pediatrics and amputations. Thereafter, breakout groups will facilitate further exploration of these complex topics by providing hands-on learning, problem solving and discussion.

Speakers/Objectives:

Lecture Program - Complex Splinting and Complex Splinting Case Reviews
Speaker: Nora Barrett, MS, OTR/L, CHT
Objectives: At the conclusion of the presentation, the participant will be able to:
1. Understand and review pertinent hand anatomy as it relates to splinting
2. Appreciate tissue healing and scar characteristics that contribute to complex splint-making decisions
3. Assess for source of soft tissue pathology that may benefit from splinting
4. Identify splinting options for limited target tissue beyond basic resting burn splints

Lecture Program - Rehabilitation of the Burned Hand – Exercises
Speaker: Doug Baron, BSc, PT
Objectives: At the conclusion of the presentation, the participant will be able to:
1. Review team approach
2. Review the need for hand exercises as part of the rehabilitative process
3. Review wound healing
4. Review anatomy
5. Plan and execute an appropriate exercise routine

Lecture Program - Pediatric Hand Burns – Optimizing Outcomes
Speaker: Trudy Boulter, OTR, CHT
Objectives: At the conclusion of the presentation, the participant will be able to:
1. Understand hand anatomy, biomechanics and hand function specific to the pediatric population
2. Discuss clinical reasoning and considerations of treatment method; acute and long term components
3. Improve knowledge of pediatric hand burns based on a case study

Lecture Program - Upper Limb Loss with Burn Injury: Rehabilitation Program Guidelines
Speaker: Sandy Fletchall OTR/L, CHT, MPA, FAOTA & Hector C. Torres BS, IT
Objectives: At the conclusion of the presentation, the participant will be able to:
1. Identify benefits of early intervention of burn injury with ULL
2. Identify value of specific prosthetic components
3. Identify different types of prosthetic components
4. Identify benefits of long term follow up through an Amputee Clinic
Complex Splinting and Complex Splinting Case Reviews

By Nora Barrett, MS, OTR/L, CHT
The Splinting “Complex”

• Any splint besides static deemed “complex”
• Splints labeled by purpose, NOT diagnosis
• What should the splint accomplish?
• What tissues need to be protected, supported, assisted, or elongated?
Tissue Healing Phases

- **INFLAMMATION**: Clean-up crew
  - Predictable joint positions
  - Muscle inhibition
- **FIBROPLASIA**: Building crew
  - “One wound” concept
  - Wound contraction: myofibroblasts
  - Cross linking begins: 15% tensile strength at 3wks
- **REMODELING**: Decorating crew
  - Strength & function
  - Scar bulk related to synthesis-lysis balance
  - Stress/tension effects on scar orientation

Burn Tissue Healing Characteristics

- Prolonged inflammatory phase
- Overlap between phases
- Synthesis-lysis imbalance
  - Hypertrophic scar
  - Keloid
- Splinting considerations
  - Edema
  - Extensor tendon viability
  - Exposed tendons/joints
  - Tendon imbalance
  - Nerve involvement
Scar

• (Up to) 80% strength normal tissue
• “Sticks together” – Meals
• Most adverse clinical consequences
  – Joint stiffness & tendon adherence – Peacock
• Stress-deprived scar
  – Reduced strength & flexibility – Arem & Madden
• Stretch vs. Grow
  – Restoring length to shortened tissue after disuse – Brand

Differential Tissue Assessment

Stiffness

• Immobilization + trauma = stiffness
  – Adaptive shortening
  – Involves periarticular connective tissue
• Tissue compliance
• Chronic stiffness components
  – Multiple joints stiff & tissues adherent
  – Chronic edema
  – Ineffective pattern of motion – Colditz
Mobilization Splints

• Dynamic
  – Elastic traction
  – Applied stress, tension adjusted
  – Slight over-pressure
  – Can act as “assist”
  – Adjunct to manual stretching & active exercise
  – End-feel has “give”

Mobilization Splints

• Static Progressive
  – Inelastic traction
  – Intermittent force with periodic removal
  – Resistive joint, firm to hard end-feel
  – Tissues held at maximum passive length
  – Unremitting over-pressure

Mobilization Splints

• Serial Static
  – Inelastic traction
  – Prolonged gentle, tolerable force
  – Resistive joint, firm to hard end-feel
  – Indicated if continued inflammatory response
Mobilization Casting

- CMMS – Colditz
  - "Casting motion to mobilize stiffness"
  - Indicated for "chronically stiff hand"
  - Similar to restrictive splinting
  - Prolonged use in controlled arc of motion
  - Can be serially adjusted

Next Year Is Here!
REFERENCES


Rehabilitation of the Burned Hand - Exercises

By Doug Baron, BSc, PT
Rehabilitation of the Burned Hand – Exercises

Doug Baron BSc PT (IIWCC)
Alberta Children's Hospital
Calgary, Alberta

Goals and Objectives

- Review team approach
- Review the need for hand exercises as part of the rehabilitative process
- Review wound healing
- Review anatomy
- Exercise routine

Multidisciplinary Burn Team

- Patient and family
- Surgeons, MD’s
- Nurses
- Dietician
- PT
- OT
- Social Work
- Psychology
- Medical Photographer
- Child Life Therapist
Why hand exercises?

- Maintain or restore maximum functional capability
  - Education
  - Prevent contracture / increase ROM
  - Reduce or control edema
  - Maintain or restore strength and endurance
  - Sensory re-education
  - Promote independence
  - Psychological support

Glassey, 2004

The acute burned hand

Wound Healing

- Systemic Response
  - Sympathetic Nervous system - ↑ perfusion
  - Endocrine System – Cortisol release, ↑ glucose availability for cellular activity
  - Influences: age, nutrition, chronic disease

- Local Response
  1. Inflammation
  2. Fibroplasia / Proliferation
  3. Maturation / Remodelling
**Inflammation**
- Hemostasis – platelets/fibrin
- Vasodilatation – chemical mediators
  - Growth factors – vessel growth
  - Neutrophils – clean up debris
  - Macrophage attraction
- Approximately 3-5 days in length
  - Prolonged by ineffective wound care, edema, poor nutrition, aggressive therapies, co-morbid diagnoses/meds
- S/S: pain, erythema, edema, ↑ temp
- Treatment
  - Reduce pain and edema
  - Protect and position

**Fibroplasia / Proliferation**
- Macrophage signals fibroblast migration
  - Collagen / elastic matrix
  - Angiogenesis
  - Granulation tissue
  - Wound contraction with myofibroblasts
- Epithelialization
  - Epidermal growth factor
  - ↑ vascularization, epidermal cell differentiation
- Can last up to 6 weeks or longer
- Treatment
  - Early – position / protect
  - Later – gentle stress to assist collagen deposition especially around joints

**Maturation / Remodelling**
- Devascularization – paler in colour
- Collagen maturation along lines of stress
- Increased strength
  - ~50% strength at 6 weeks
- Can last up to 2 years
- S/S
  - Early – raised, red
  - Mature – soft, flat, pale
- Treatment
  - Continue with splinting and positioning if needed
  - Active stretching
  - Strengthening
Anatomy

- Extrinsic muscles
  - Forearm rotation (supinator, pronator teres, pronator quadratus)
  - Wrist flexion (FCR, FCU, PL)
  - Wrist extension (FCRL, FCRR, FCU)
  - Wrist deviation
    - Ulnar (FCU, ECU)
    - Radial (FCR, ECRL, APL, EPB)
  - Digit flexion (FDS, FDP, FPL)
  - Digit extension (ED, EDM, EI, EPL, EPB, APL)
Anatomy

- Intrinsic Muscles
  - Digit Flexion (Lumbricals, Interossei, FDM)
  - Digit Extension (EDM)
  - Thumb Flexion (FFB, OP)
  - Thumb Abduction (APB)
  - Thumb Adduction (AF)
  - Thumb Opposition (OP, FFB, APB, ODM)
  - Finger Abduction (Dorsal interossei, ADM)
  - Finger Adduction (Palmar interossei)

Intrinsic Muscles

Exercise Routine

- Initial Assessment including dates of injury, surgery, etc.
  - Baseline measurements of ROM, strength, sensation
- Goal setting with client and family as appropriate
- Develop a exercise program based on assessment and client goals
- Depends on client’s current medical status and any pre-existing medical conditions
Exercise Routine

- Fine balance between rest and mobility based on stage of wound healing
- Suspended post op auto grafting for about 4 – 5 days
- Ensure dressings are not restrictive to ROM
- Children
  - Structured / unstructured play activities using upper extremities and hands
- Adolescents and Adults
  - Need more structured / specific ROM activities

Exercise Routine

- Cardiovascular
  - Aerobic conditioning
- Stretching
  - Passive - slow prolonged, CPM
  - Active elongation
- Strengthening
  - Active
  - Resistive
- Functional activities
  - ADL’s
  - Promote independence

ROM Exercises Handout
References

1. Glassey N. Physiotherapy for burns and plastic reconstruction of the hand. W hurr Publishers, 2004
Pediatric Hand Burns -
Optimizing Outcomes

By Trudy Boulter, OTR, CHT
Pediatric Hand Burns: Optimizing Outcomes

Trudy Boulter, OTR, CHT
Angela Drelles BSN, RN
Maureen Andrews MSN, RN

“Creative thinking may simply mean the realization that there is no particular virtue in doing things the way they have always been done”
R. Von Oech, Rudolph Flesch

Disclosures

- No relevant financial relationships with any commercial interests.
- There are graphic pictures involved in this presentation.

Objectives

- Review of TCH hand burn statistics
- Overview of hand anatomy, biomechanics and hand function specific to the pediatric population
- Discuss clinical reasoning and considerations of treatment method; acute and long term components
- Review of case study
TCH Hand Burn Injuries Statistics

- Approximately 3 new hand burn injuries per week are treated in our burn clinic
- 65% of these patients had injuries from heat contact
  - Most common hand injury from contact with a gas fireplace glass door
- 6-10% of these patients hand burn injuries from friction burns

Pediatric Hand Burn Injury Types

- **Contact**
  - Stovetop/Oven
  - Fireplace glass door
  - Iron (curling or clothes)
- **Friction**
  - Vacuum
  - Treadmill
- **Scald**
  - Running water
  - Coffee/tea
  - Soup
  - Liquids from microwave
- **Flame**
  - Fireworks
  - Campfire or embers

All Wounds Heal by Contracture

- Burn injury crossing critical joints on the flexor surface
- Healed without adequate intervention
- Non-functional finger
Contracture

Hand Burns represent the most common area of contracture development.

Kraemer et al. Burn contractures: incidence, predisposing factors and results of surgical therapy. JBR 1988;9;261-5

Normal Hand Anatomy

- 19 bones
- 7 carpal bones
- 17 articulations
- 19 muscles situated entirely in the hand
- Approximately the same number of tendons activated by forearm muscles.

Critical Anatomical Features

- Creases:
  - Thenar crease
  - Distal palmar crease
  - Longitudinal crease

- Joints:
  - MP joints
  - IP joints
  - CMC joint
Characteristics of Skin

- Skin and sensation
  - Elasticity of the dorsal skin
    - Fine, supple, mobile
    - 13 cm extension - 17 cm in flexion
    - Breadth 14-18 cm
  - Stability of the palmar skin
    - Role protection
    - Rich in sensory information

Extensor Mechanism

- Biomechanical Forces
  - Power of the flexor tendons
  - Fragility of the extensor mechanism
**Pediatric Hand Injury: Appreciation of Development**

- Growth and development
- Age-appropriate activities
- Assessment of current developmental status
  - Fine motor skill
  - Developmental/gross motor skill acquisition
- Activities of daily living: hand writing, self feeding.

“*The possibilities and varieties of function are realized through the unique structure of the hand*”

Tubiana

**Clinical Reasoning**

Systematic Problem Solving Approach

- **Wound-**
  - edema, depth, infection, mechanism of injury
- **Location/age/range of motion**
  - Palmer vs dorsal, Critical anatomical landmarks
- **Team Plan of Care**
  - Current developmental skills
  - Follow up expectations
- **Best Practice:**
  - Dressing? Splint? Cast? Active use?

“Burned hands are best treated by a therapist who specializes in burn rehabilitation”

Richard, MS, PT et al. Burn Rehabilitation and Research: Proceedings of a consensus summit. JBCR 2008; 30: 549

**Hand Burn Injuries**

- Minor but crosses joint
- Partial to full thickness in depth

Concerns:
  - MP flexion
  - Abduction
  - Web space
Hand Burn Injuries

- Areas of concern:
  - Scarring/contracture of the edges of the wound
  - Pull of the flexion contracture on landmarks
  - Contracture of web space
  - Impact on expansion of the longitudinal crease.

Clinical Assessment: Palmar Burn

- Age of the patient
- Mechanism of injury
- What anatomical landmarks does the burn cross?
- Depth of the burn
- Current range of motion
- Edema or infection present
- Current developmental skills

Clinical Assessment: Dorsal Burn

- Age of the patient
- What anatomical landmarks does the burn cross?
- Depth of the burn
- Current range of motion
- Edema or infection present
- Fragility of the extensor mechanism
- Current Developmental skills
Hand Burn Injuries

Monitoring:
- Check pulses via palpation of doppler
- Elevate extremity above level of the heart during transport
- Escharotomy if needed - to be done only in a burn center or by a hand surgeon
- Skin graft

Types of Immobilization

- Custom made splints
- Soft dressing
- Soft casting - plaster for specificity

Wound Healing and Scar Formation

- Location and depth are key indicators of outcome
- Appropriate intervention and family participation are critical
- Small burns in critical areas can significantly impact a child’s development
- Inconsistent follow through during the acute and inflammatory phase, may result in a permanent loss of function
Ongoing Assessment

- Wound healing
- Scar bands
- Functional goals and activities
Upper Limb Loss with Burn Injury: Rehabilitation Program Guidelines

By Sandy Fletchall, OTR/L, CHT, MPA, FAOTA
& Hector C. Torres, BS, IT
Upper Limb Loss with Burn Injury: Rehabilitation Program Guidelines
Sandy Fletchall OTR, CHT, MPA, FAOTA
Capabilities For Living, LLC
Memphis, TN

Incidence of Upper Limb Loss
- 45% Trauma related
  - 66% < 45 years of age
- 54% Vascular related
  - 64% > 65 years of age

Facts: Upper Limb Loss
- 60% employed
- 92% Caucasian
- 70% distal to elbow

Literature review
- Early prosthetic fit
  Malone, Roeschlein, Fletchall, Davidson, Meier, Atkins
Literature Review

- ADL and RTW
  Millstein; Burrough & Brook; Drench; Meier & Atkins; Fletchall

Literature review

- Depression/PTSD
- Pain/phantom limb
- Body image
  Davidson; Fisher & Hanspal; Cheung et.al; Watanabe et.al; Meier & Atkins

Guidelines-ULL with Burn Injury

- Few with poly-trauma diagnosis
- Maximize return-function
- Minimize costs

Begin Early

- Educate
- Residual limb function
- Total body function
- Peers
Motion

- Body and residual limb motion
- Neck motion
- Strengthening

Residual limb

- Shape
- Size
- Pressure
- Motion

Prosthetic Education

- Types
  - Body power
  - Myoelectric
  - Hybrid
- Components
- Terminal Devices

Prosthetic Considerations

- Body Power
  - Lighter weight
  - Accommodate residual limb changes
  - Visual feedback
  - Tactile feedback
  - Heavy activities
  - Cost
Prosthetic Considerations

- Myoelectric
  - Voluntary muscle contraction
  - Stable residual limb
  - Appropriate strength
  - Power prehensor
  - costly

Prosthetic Consideration

- Hybrid electronic
  - High levels
  - Daily maintenance
  - Power prehensor
  - costly

Prosthetic Casting & Delivery

- Golden Period
- Delivery & Training

Prosthetic Training

- Education
- Operation
- Wearing tolerance
- Functional tasks
Pre-Injury Activities

Formal Follow-up

- Scheduled clinic
- All team members
- Re-assessment
  - Physical
  - Prosthetic
  - Home/work/vehicle
- Life Care Input
### Two Groups-Comparison

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<th>Secondary referral</th>
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<td>Avg. age</td>
<td>32.46</td>
<td>33</td>
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<tr>
<td>Males</td>
<td>13</td>
<td>8</td>
</tr>
</tbody>
</table>

- **Initial Referral**
  - Electrical: 9
  - TBSA: 18%
  - Thermal: 4
  - TBSA: 49.75%

- **Secondary Referral**
  - Electrical: 5
  - TBSA: 25%
  - Thermal: 3
  - TBSA: 46.3%

### Treatment Sessions

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<th>Initial referral</th>
<th>Secondary referral</th>
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<tbody>
<tr>
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<td>Treatment: 57.77</td>
<td>Treatment: 146</td>
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</table>

- 5
- TR
- 2
- Bil. TR
- 2
- TH
- 1
- Bil. TH
- 0
- Shld. Dis
- 3
- Other Injuries
- 4
### Treatment Sessions

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<th>Treatment</th>
<th>Others</th>
<th>Ours</th>
<th>Delay entering</th>
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<tr>
<td>Initial referral</td>
<td>57.77</td>
<td>96.50</td>
<td>48.88</td>
<td>8.75 months</td>
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<tr>
<td>Secondary referral</td>
<td>146</td>
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### Prosthetic Fit Comparison

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<th>Referral</th>
<th>Prosthetic fit</th>
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<tr>
<td>Initial referral</td>
<td>9.15 wks.</td>
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<tr>
<td>Secondary referral</td>
<td>42.57 wks.</td>
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### Outcomes

<table>
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<th>Referral</th>
<th>Bachelor of living skills</th>
<th>Work/school</th>
<th>Prosthetic user</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial referral</td>
<td>100%</td>
<td>92%</td>
<td>92%</td>
</tr>
<tr>
<td>Secondary referral</td>
<td>100%</td>
<td>38%</td>
<td>50%</td>
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### Summary

- Begin early, education
- Maximize motion, strength
- Peers
- Experienced team members
- Appropriate prosthetic components
- Minimize costs: Maximize function
REFERENCES


Fletchall S. “Value of Specialized Rehabilitation with Trauma and Amputations”, presented American Academy of Orthotists and Prosthetists Annual Symposium, Orlando, Florida. 2005 March 18


BREAKOUT SESSION: COMPLEX SPLINTING

By Nora Barrett, MS, OTR/L, CHT
Complex Splinting Breakout

CASES

Nora Barrett, OT/CHT

Case 1

• 25 yo M
• Motorcycle crash
• 50% TBSA flame burns
  face/neck/trunk/
  UEs/flanks
• B DR fx s/p ex-fix
• L UE AE amputation

Full thickness dorsal hands
Pinned intrinsic+ x6 weeks

Active motion at 6 months

Case 2
- 24 yo M GSW L shoulder
- Brachial plexus and axillary artery injured
- L FA compartment syndrome s/p release, CTR, interossei release
- STSG to volar L FA at fasciotomy site
BPI, multi-level peripheral neuropathy

- Weak wrist extension
- Tight into wrist extension (volar FA STSG)
- Only digital motors: EDC, EPL
- Uninhibited extensors
- (+) extrinsic extensor tightness
- No intrinsics

Flexion SPS 4-5x/day x20-30 min

Static thumb opposition
Next step: tenodesis splint

- Wrist driven tenodesis splint
- Wrist extension >3+/5
- Not candidate for radial palsy tenodesis splint
  - No digital flexors

Case 3

- 27 yo M 3 years s/p electrical injury R hand
- Lost thumb, IF
- Multiple releases, revisions, flaps

Residual R hand grasp
Static opposition post

Dorsal based

Cosmetic prosthetic
Case 4

- 22yo M
- Dorsal hand grease burn s/p xenograft
- Refused 2nd surgery for autograft

Delayed healing

Posturing: CMMS (cast then DBS)
SF hyperextension: scar

Anti-claw splint

- Transitioned from DBS full time except hygiene to DBS night, anti-claw day
- Continued anti-claw full time except exercise

(+)IF intrinsic tightness
Intrinsic tightness test

- Assess isolated passive PIP flexion with MCP in extension then with MCP in flexion
  - (+) for intrinsic tightness with more PIP flexion when MP flexed

MCP block splint

- For exercise only
- Active hook fist
- MCPs positioned in hyperextension at all digits
  - Lengthen intrinsics
- Can isolate IF

Case 5

- 48 yo M flame burn R dorsal hand (campfire)
- Multiple medical issues
- Prolonged hospitalization
- Serial casting
SF amputated, RF breakdown

Resting posture

Grade II MCP extension contracture
MCP flexion SPS

Case 6

- Congenital volar compartment syndrome, unknown origin
- s/p Apligraft
- Minimal active flexion
- Limited composite flexion PROM
- @6 months

Dorsal based dynamic digital flexion
Go get ‘em!
BREAKOUT SESSION: EXERCISES

By Doug Baron, BSc, PT
BREAKOUT SESSION: PEDIATRIC HAND INJURY

By Trudy Boulter, OTR, CHT
BREAKOUT SESSION: REHABILITATION

By Sandy Fletchall OTR/L, CHT, MPA, FAOTA
## Breakout

- Terminal Devices
- Sockets
- Harness
- Myoelectric
- Body power
- Coban wrap for hands
- Etc.
Silon & Oleeva scar management products have been used in burn centers and plastic surgery clinics around the world since the early 1990s. Bio Med Sciences is the only company to offer a comprehensive portfolio of scar management products—each designed to fit a specific clinical need.

**Silon Family of Scar Management Products**

- **Silon®** professional scar management products are designed for specialized applications—such as masks for facial burn injuries and inserts for compression garments.

- **Oleeva® Scar Management Solutions** are specifically designed for cosmetic and reconstructive surgery patients as well as general consumer use. These products offer an excellent combination of adherence and comfort with unsurpassed durability.

*THE SILON® FAMILY OF SCAR MANAGEMENT PRODUCTS offers a comprehensive, innovative approach to reducing and preventing scars in both professional and consumer environments.*